Computers & Electronics April 1984

Hardware Review

SINCLAIR'S NEWEST BOMBSHELL

The Sinclair QL promises to change the rules of the computer pricing game/By Les Solomon

IN computers, the name Sinclair has always been synonymous with physically small, very-low-cost computer packages like the ZX80 and ZX81. In the United States, these and the latest (until now) Sinclair computer, the TM 2068, have been sold in conjunction with the Timex name.

Now Sinclair has introduced the QL (as Sir Clive Sinclair defines it—the Quantum Leap) computer, its first try at a small business system. A far cry from the small computers that made them famous, the Sinclair QL is priced at $499—but it offers quite a bit for the money.

When will you see it? Well, it's expected to be available in England by now, and as soon as it has its American design finished and passes the required FCC tests, it will be here. This is estimated to be about the middle of the summer. However, don't look for it under the Timex label, as it is purely a Sinclair venture.

A Look at the QL

This 5⅞" × 1¼" × 18¾", 3-lb package features an 16/32-bit Motorola 68008 running at 7.5 MHz as the main CPU with an Intel 8049 handling such housekeeping chores as the keyboard, sound, RS-232C ports, and real-time clock. Since the 68008 can address one megabyte of non-segmented address space, it can be provided with a wide variety of peripherals and enhancements. Four Sinclair-designed semicustom IC's control memory and display, local-area networking, RS-232C operation, and the microdrive data storage system.

The basic system comes with 128K of RAM expandable to 640K via a RAM pack, and 32K of ROM supporting Sinclair SuperBASIC and Sinclair's new QDOS operating system. The two built-in microcassette drives (similar to those used in previous Sinclair machines) hold 100K each and can be complemented by six external microdrives for a total of up to 800K of data storage. Each microdrive can be write-protected, contains 200' of video-quality tape moving at 30 ips, and has a typical access time of 3.5 seconds (7.5 seconds to make a full pass). Storage is divided into 255 sectors at 512 bytes per sector. There is no cassette I/O port.

The full-size, full-travel, 65-key QWERTY keyboard has five function keys, four independent cursor-control keys, and a normal-size space bar. A membrane under the keyboard protects the electronics from accidental damage due to liquid spillage over the keys. The keys "click" when fully depressed to indicate that proper contact has been made.

High-resolution color graphics are available at both baseband video and r-f (channels 3/4). There are two modes—512 × 256 pixels with black, white, red, and green; or 256 × 256 pixels with blue, magenta, cyan, and yellow added. The video display uses 32 K of RAM.

Les Solomon was one of the few U.S. journalists at Sinclair's official unveiling of the QL in London.

Alphanumerics are software controlled to display 85 characters on 25 lines for suitable video monitors, or 40 characters when a TV receiver is used.

Also provided are two RS-232C serial ports with baud rate selectable between 75 and 19,200 baud, and a local area network that allows up to 64 QL's or Sinclair Spectrum's to intercommunicate at 100K baud. Two joystick ports, and a ROM cartridge connector are available via rear apron connectors.

Operating System and Basic

The operating system for the Sinclair QL is called QDOS. In addition to conventional DOS commands, QDOS also provides multi-tasking and up to 20 independent "windows" that can be configured as the user desires. These can be "called" by a simple WINDOW statement in Sinclair SuperBASIC, with a selection of parameters and colors. Thus, a number of programs can be running simultaneously with each independently displayed within its own window.

Sinclair SuperBASIC contains the usual BASIC commands and statements, as well as such items as BAUD (rate select), BEEP (with various parameters to create desired sound), window BORDER color, CIRCLE (parameters), SCREEN (set character size), CURSOR x/y (for positioning), DRAW (from/to), EXEC (sequence of programs), FLASH (on/off), REPEAT (if, then), PLOT (at), PAPER (background color), PAN (move current window right or left), MODE (monitor or TV), SBYTES (allows area of memory to be saved), SCALE (of graphics), SCROLL (display up or down so many pixels), TRACE (on/off), UNDER- (line), and others.

Bundled Software

Bundled with the Sinclair QL are four software packages. All are interactive and take advantage of the color display capabilities. The first bundled package, QL Quill is an interactive word processor and includes all the usual facilities such as insert, erase, copy, move, search, replace, tabs, headers, footnotes, justification, etc. This software will support 40/60/80/132 characters. Like most good word processors, the screen display can be divided to show status, control, and the main writing area. A help menu is provided and color is used to good advantage. Frequently used editing commands can be assigned to a single function key if desired. Data from any of the bundled packages can be transported to any of the others.

QL Quill is a "what you see is what you get" type of word processor. This means that if you perform an action like boldface, you'll see it on the screen. Since the word processor can be used in the 40-column mode with a TV receiver, a "Viewing" feature is available that lets you check for overall layout and format of the page. This feature is also needed (even when a monitor is used) for viewing very wide documents.

The second package, QL Abacus, is the Sinclair version of a spreadsheet. In this utility, there are 256 rows and 64

The QL comes with two 100K microcassette drives

columns. To make calculations easy, the user can tie a "name" onto any row, column, or cell for use in formulas. Calculation accuracy is to 16 significant figures, and two or more spreadsheets can be consolidated or merged.

An important feature of QL Abacus is that it will automatically apply the rules or formulas entered to whole rows, columns, or blocks of cells in a simple manner. For example, "Row = 100" puts 100 in each cell of the current row, or even more powerfully, one can set up the row "Profit" as "Profit = Sales - Costs" and the formula to subtract the row "Costs" from the row "Sales" is done automatically.

Other features of Abacus are the use of multiple windows, the variation of widths and justification of text, the use of different units including monetary (with arbitrary symbols), integer, percentage, decimal, and exponential form, and the ability to prompt an operator for the input of data as part of the worksheet. The screen can be selected for 40-, 60-, or 80-column widths.

The third piece of software, QL Archive, is a database that can be used for almost any type of information retrieval with the screen and printout customized as desired. This software does not use SuperBASIC but a derivation of it that is much faster and uses some eighty commands.

Archive commands are arranged in a "Pyramidal" form. That is, the most commonly used commands are immediately available, with layers of secondary commands available via menus. Such features as sorting, searching, and selection of records are provided, along with full string manipulations, operators, and fast arithmetic. Variable length fields and records are used. Several examples are provided that can be modified by the user. Multifile searching and cross reference allows data from the other software to be used in the database.

The last bundled package, QL Easel, is an interactive graphics package that features eight preset formats that can be called with a single keystroke. This allows bar graphs of different colors and styles (stacked or overlapping bars, line graphs, pie charts, and combinations) that can be altered as required. Text or graphics can be placed anywhere on screen and moved as required by the manipulation of a set of "cross hairs." Colors of bars, borders, and backgrounds, can be selected from an array of 17 different ones, plus one color that the user can define himself. In the pie charts, any sector can be lifted out for ease of recognition.

Easel is also designed to handle data entry (via simple formulas), manipulation, display, and printout in a self-contained manner. Easel can retrieve data from Abacus or Archive, or send graphs to Quill for inclusion in a document.

Like the other QL packages, Easel also features three screen areas: status, control, and main areas. And, like the others, these can be changed as desired. Full color is used, with color selection available.

Each QL package comes on its own microcassette. All four packages use 320K of tape storage.

Comments on the Sinclair QL

We had a chance to get a "hands on" look at the QL for about half an hour. We used it connected to both a TV receiver and an RGB video monitor. Since this took place in England, both the displays were in PAL chroma at 625 lines and 5.5-MHz bandwidth—somewhat better than the 525-line, 4.5-MHz U.S. equivalents. We could not run any

benchmarks, but from what we did see, SuperBASIC is fast—almost like a compiler rather than an interpreter.

The microdrives are quiet in operation, and faster than you would expect. The cassettes are easy to handle and install. Each QL package comes on its own microcassette, and loading these is both simple and fast. The keyboard has a smooth and comfortable "feel", not the least like the older Sinclair keyboards.

The alphanumerics and graphics are excellent, and comparable to any high-resolution display we have seen. The colors are crisp and clean (this may have been due to the use of an RGB color video monitor instead of a low-bandwidth color-TV receiver), and you can switch from 40 to 80 characters with a keystroke.

The QL packages were the only applications available, although I was told that several software houses (in England) were working on material that should be ready for the American unveiling. Other high-level languages including a Pascal compiler, a terminal emulator, and a 68000 assembler are also in the offing according to a Sinclair spokesperson. Future hardware includes a 0.5-megabyte RAM expansion board, an A/D converter, a hard-disk interface, a modem, a parallel printer interface, and an IEEE-488 interface. However, a mouse is not planned.

In addition to multitasking, QDOS allows up to twenty independent windows

There is no question that the Sinclair QL is an exceptional value. But there are problems that the machine faces on both the business and home fronts. For business purposes, it is an attractive package, but the business world is having a love affair with MS-DOS right now. It doesn't seem likely that Sinclair can change its image of a "toy" computer manufacturer overnight. And where will support come from? Also, there's the question of using microcassette tapes rather than floppy disks. It appears that, in the business arena, Sinclair has much convincing to do.

Sinclair should have an easier time on the home front where it made its mark in the past. However, competition here is severe with Commodore, Apple, and IBM all having a strong foothold in the market at various price levels. And how is Sinclair going to distribute the QL? Right now they plan on selling it through mail order, which has its limitations. Also, for home purposes, some of the power of the machine will not be realized. For example, most consumers probably won't buy a high-quality RGB monitor for the QL since the cost could run twice as high as the QL itself.

Thus, although Sinclair has performed an extraordinary technological feat with the QL, the ultimate success of the machine may depend on factors that have more to do with market considerations than technology. ◆

TIMEX/SINCLAIR USERS GROUP
OTTAWA/HULL CHAPTER
MEMBERS INFORMATION SHEET

NAME:
ADDRESS:

POSTAL:

TEL:_____(HOME) _____(BUSINESS)

LIST CURRENT HARDWARE EQUIPMENT(ie.ZX-81,64k,HRG,Keyboard,etc....)
-
-
-
-
LIST GENERAL ITEMS OF SOFTWARE(ie.utility,games,educational,etc...)
-
-
-
-

INDICATE WITH A CHECK MARK YOUR INTEREST IN THE FOLLOWING

HARDWARE___ UTILITIES___ EDUCATIONAL___ BUSINESS___
COMMUNICATIONS___ GAMES___ EXPERIMENTER___
PROGRAMMING IN: BASIC___ ASSEMBLER___ FORTH___ OTHER___
OTHER INTERESTS _____

INDICATE YOUR LEVEL OF PROGRAMMING EXPERIENCE IN BASIC:

LOW___ INTERMEDIATE____ HIGH____

MEMBERSHIP NO:_____

4 DELETE
Two REMOVE markers, inverse ‡, must be entered into the text, and then the DELETE routine will remove the text between the two markers, and the markers. Each inverse ‡ is entered by pressing GRAPHICS (SHIFT 9). DELETE leaves the cursor at the start of the text.

5 MOVE
Enter two REMOVE markers, inverse ‡, and one MOVE TO marker, inverse $, into the text. Then the MOVE routine transfers the text between the two REMOVE markers to the position of the MOVE TO marker, and the markers are removed. The MOVE TO marker, inverse $, is entered by pressing THEN (SHIFT 3). MOVE leaves the cursor at the start of the text.

6 SEARCH
Press 6, and then enter a search string up to 75 characters long. The entry routine operates in Basic, so to enter capital (inverse) letters, markers or special characters, GRAPHICS must be used in the normal way. The SEARCH routine will go through the text, and stop with the search string at the top of the screen when it is found. Press C to continue the search, or W to work on that part of the text. After working on the text from the SEARCH routine, when EDIT is pressed to go to the MENU, the end of the SEARCH routine will be displayed. Also working from the SEARCH routine causes the display to lose synchronization with the text and it will likely not be possible to get to the start of the text. Use LIST to get back into sync.

7 REPLACE
One or two replace strings can be entered. The first is a maximum 75 characters long and the second is 25 characters long. After pressing 7 the present contents of the first replace buffer are displayed. If this is not what you want to replace press N and enter the string to be replaced. The entry routine is again in Basic, so GRAPHICS mode must be used for capitals, markers and special characters. When this is correct press Y and then enter the replacement string. Press Y when correct and then select one or two strings. When the replacements are completed a return is made to the MENU. REPLACE leaves the cursor at the start of the text.
Do not have the string to be replaced as an exact sub string of the replacement string or the program will go into a loop

VARIABLES using REPLACE
The replacement string automatically becomes the string to be replaced when REPLACE is finished. Therefore to insert variables into the text enter the part to be changed as the string to be replaced and the first variable as the replacement string. Print the text, and then use REPLACE to enter the next variable. The first variable will automatically have been made the string to be replaced.
ie. For a form letter use the first string for the address and the second shorter string for the person's name. A code such as ZZZ, that will not be used elsewhere in the text, can be used to mark the initial position of the variables.

8 PRINT
The printer must be ready to print, and the start and end marks (SHIFT 2) must have been entered. Press 8 and then if the text is to be printed in pages press Y. N will immediately print the text without pages. Next enter the starting page number. Enter the number of lines per page and the text will be printed as specified. Maximum page number is 99. You can print duplicate copies by pressing Y when the printer is finished.

9 SAVE
Press 9, and when the recorder is ready press C. This will SAVE "WSII" with the text and return to the MENU when LOADed.

Expanded Print

To expand the height of print enter an expand marker, inverse >, into the text. This is done by pressing GRAPHICS (SHIFT 9) in FUNCTION mode. The expand marker should follow the start marker, inverse 0, or an ENTER, inverse £, and can be before or after a Tab marker. To get back to normal print enter the expand marker again. Again it should follow an ENTER mark.
When printing in pages an expanded print line counts as only one line.

SUGGESTIONS
After using DELETE, MOVE, or REPLACE use LIST to get to the part of the text you wish to work on.
When replying to screen prompts press the keys firmly. These parts of the program are mostly in SLOW Basic and response is not quite instantaneous.
SAVE before printing, and periodically

DEMONSTRATION ENTRY

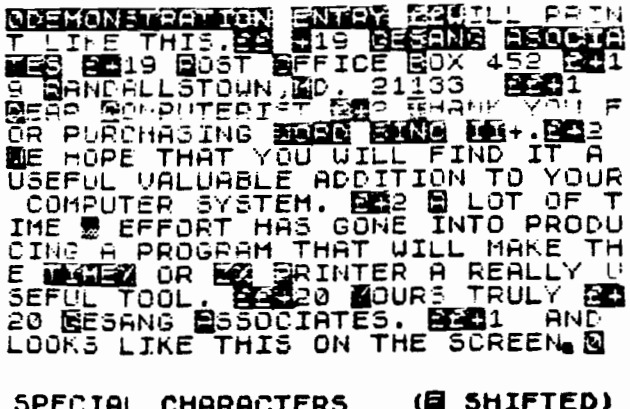
Will print like this.

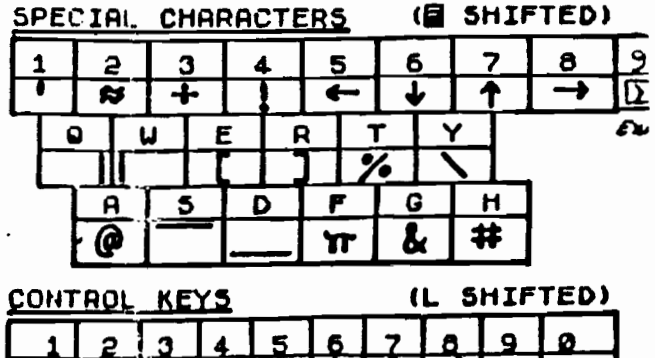
GESANG ASSOCIATES
Post Office Box 452
Randallstown,Md. 21133

Dear Computerist,
Thank you for purchasing WORD SINC II+.
We hope that you will find it a useful valuable addition to your computer system.
A lot of time & effort has gone into producing a program that will make the TIMEX or ZX Printer a really useful tool.

Yours truly
Gesang Associates.

and looks like this on the screen!





DISTRIBUTED IN U.S. BY "GESANG ASSOCIATES"

P.O. Box 452 RANDALLSTOWN, Md. 21133

WORD SINC II Instruction Manual

Program & Manual Copyright
July 1983 P.Hargrave

LOAD "WSII" Load time 3:25

WORD SINC II is a full feature word processor that will transform your computer (ZX81, or Timex 1000-1500) and printer (ZX Printer, or Timex 2040) into a real word processing system. WSII prints 42 characters per line in UPPER CASE & lower case, plus 20 special characters.

INTRODUCTION

When first LOADed the WSII Menu will be displayed on the screen. At this time the only menu commands that will function are: 1 START NEW, and 9 SAVE, as the program must be initialized with START NEW before commands 2 to 8 will function.

Initialize the program by pressing 1 and then C. The flashing cursor will appear at the top of the screen and the number 8000 at the bottom center. This is the number of free bytes (spaces) left in memory, and is constantly updated as text is entered. At the bottom right will be the letter L. This indicates the program is in letter mode and will print unshifted letters as lower case, numbers as normal, and shifted letters as UPPER CASE. Shifted numbers are the control keys plus DELETE. FUNCTION (SHIFT+ENTER) changes the L to inverse F. In the FUNCTION mode the program will print punctuation, the 20 special characters (shown as graphics on the screen), plus COPY-unshifted Z, and BREAK will function.

Whenever the flashing cursor is on the screen WSII is operating in machine code and the keyboard is transformed to function like a typewriter.

When entering text be sure to put a space after each word.

To expand WSII if you have more than 16K RAM: BREAK at the MENU, LIST 20, EDIT and change the 8000 in line 20 to the amount of user RAM you have minus 8384. ENTER the modified line 20, and then press RETURN and ENTER.

Don't forget to raise RAMTOP before using the expanded version.

AUTO REPEAT

All keys will automatically repeat if held down in L mode. In F mode only one entry is made and then the mode shifts back to L. Speed of the auto repeat is controlled by the number in address 16547. This is set at 120, but can be altered by POKEing a different number, up to 255, into 16547. A smaller number is faster. If auto repeat is set too fast accidental multiple entries will be made and it will be hard to get into F mode.

CURSOR CONTROL

Characters are entered into the space occupied by the cursor. If the cursor is not at the end of the text the character under the cursor and all characters to the right of it are shifted right. When removing a character with DELETE (SHIFT 0) the character to the left of the cursor is the one removed.

The cursor can be moved anywhere in the text using the arrow keys (SHIFT 5,6,7,8). The screen will scroll up or down automatically when the cursor reaches the top or bottom. The cursor cannot be moved past the end of the text. Move the cursor right (SHIFT 8) to get to the end of the text.

ENTER

Pressing ENTER puts an inverse £ symbol into the text. This is the carriage return, or new line, marker. It ends the line being printed and starts the next line with the following character. To print a blank line press ENTER twice.

EDIT (SHIFT 1)

Pressing EDIT at any time when the flashing cursor is on the screen will return you to the Menu.

FUNCTION (SHIFT+ENTER)

FUNCTION changes the L at the bottom right of the screen to an inverse F to show that the program is ready to accept punctuation or a special character. With SHIFT still pressed, press the punctuation or special character key. The symbol will be entered into the text and the program will shift back to L mode. If the SHIFT key is not kept down no entry will be made. Shifted SPACE gives the £ symbol, unshifted SPACE is BREAK, and unshifted Z will COPY the screen in F mode. See page 6 for a chart of the special character keys.

START & END Marks (SHIFT 2)

Before printing, the text must contain a marker at the start and end of the part to be printed. Normally, they will be the first and last characters in the text, but by changing their positions different portions of the text can be printed. Both start and end marks are an inverse 0, which are entered by pressing AND (SHIFT 2). If the start and end marks are not entered the printing will begin at the end of the text. This will produce a lot of blank paper until the end of the text

space is reached, then the program will crash. Use the BREAK key to stop the printer.

TAB (SHIFT 4)

The Tab marker, an inverse +, must immediately follow an ENTER mark, inverse £, or the start mark, inverse 0. Therefore there can be only one Tab position per printed line. The Tab marker is entered by pressing TO (SHIFT 4). The Tab position is set by entering the Tab marker, and then the number of spaces to be Tabbed, up to 38. The number MUST BE FOLLOWED BY A SPACE! The text follows this space. Tab will stay on and text will be printed and justified within the remaining columns until Tab is turned off or changed. To turn Tab off, enter the Tab marker and a SPACE after an ENTER. This will also turn Tab on at its previous setting if it is off. To change the Tab setting enter the marker, the number, and the space. This leaves the Tab on, whether it was on or off.

+12 text TAB at 12 TAB ON
+ text TAB OFF if previously on
+ text TAB ON at previous setting if off

If when printing the printer stops with an error code T, this indicates an error has been made in the use of Tab.

RESTART

To restart the program after a BREAK, enter GOTO 1. If this should happen to produce error 2/2 then try GOTO 100.

** Do not RUN! **

THE MENU

1 START NEW

Initializes the program and removes any text that has been entered. After pressing 1; C must be pressed to continue. This is to ensure that text is not accidentally erased.

2 CONTINUE

Restores the screen with the flashing cursor as it was before going to the MENU; or if used after DELETE, MOVE, or REPLACE the start of the text.

3 LIST

The text is displayed one screen full at a time. Press M to return to the MENU. C will display the next screen of text. And pressing W when a screen is listed will put the cursor at the top of the screen so that part of the text may be worked on.